REMARKS/ARGUMENTS

Reconsideration of the application is requested.

Claims 1, 3, and 7-61 remain in the application. Claims 1 and 34 have been amended.

In deference to the requirement in item 2 on page 2 of the above-identified Office action, a formal drawing overcoming all the deficiencies indicated in the Notice of Draftsperson's Patent Drawing Review (PTO-948) will be submitted by TEM PATENT, INC., 2049 Moneta Road, Bedford, VA 24523.

In item 4 on pages 2-3 of the above-identified Office action, claims 1, 3, and 7-61 have been rejected as being indefinite under 35 U.S.C. § 112, second paragraph.

More specifically, the Examiner has stated that it is unclear how the compression shock occurs "behind an end of the enclosure and outside the enclosure."

The language of claims 1 and 34 has been amended to clearly recite that the compression shock occurs downstream of the end of the enclosure and outside of the enclosure.

It is accordingly believed that the claims meet the requirements of 35 U.S.C. § 112, second paragraph. Should the Examiner find any further objectionable items, counsel would appreciate a telephone call during which the matter may be resolved. The above-noted changes to the claims are provided solely for cosmetic and/or clarificatory reasons. The changes are neither provided for overcoming the prior art nor do they narrow the scope of the claims for any reason related to the statutory requirements for a patent.

In item 6 on pages 3-5 of the above-mentioned Office action, claims 1, 7, 9-11, 13-24, 26-29, 34-36, 39, 41-44, and 46-61 have been rejected as being anticipated by Wong et al. (US Pat. No. 4,972,830) under 35 U.S.C. § 102(b).

In item 7 on page 5 of the above-mentioned Office action, claims 1, 8-11, 13-24, 34, 39-40, 43-44, and 46-61 have been rejected as being anticipated by Boiarski et al. (US Pat. No. 4,268,460) under 35 U.S.C. § 102(b).

In item 8 on pages 5-6 of the above-mentioned Office action, claims 1, 3, 9, 13, 17, 24, 31-32, 34-46, 50, 54, and 61 have been rejected as being anticipated by Wagner (US Pat. No. 4,294,208) under 35 U.S.C. § 102(b).

The rejections have been noted and claims 1 and 34 have been amended in an effort to even more clearly define the invention of the instant application.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful.

Claim 1 calls for, inter alia:

> providing an enclosure having a cross-section continuously widening in a direction of flow and towards an end of the enclosure to achieve a supersonic velocity;
>
> guiding the gas with the input particles and causing the gas to flow at the supersonic velocity to cause a compression shock to occur downstream of the end and outside of the enclosure; and
>
> breaking the input particles into output particles being smaller than the input particles by passing the input particles through the compression shock, generating the aerosol. (Emphasis added.)

Claim 34 calls for, inter alia:

> a gas guiding device configured to guide a gas having input particles suspended therein and flowing at a supersonic velocity, said gas guiding device having an enclosure with a cross-section continuously widening in a direction of flow and towards an end of said enclosure for achieving the supersonic velocity; and
>
> said gas guiding device being configured to generate a compression shock in the gas causing the input particles, upon crossing the compression shock, to be broken down into output particles smaller than the input particles, the compression shock occurring downstream of said end and outside of said enclosure.

Wong et al. disclose a device for producing an aerosol, in which a gas mixed with fluid particles is guided in a first chamber 20 in such a way that it streams against a bluff body 24 with supersonic velocity. A compression shock wave thus occurs and turbulences are formed around the bluff body. The gas is then guided to a second chamber through an output opening of the first chamber, whereby the output opening is spherically widened in the direction of flow. The gas streams with supersonic velocity and the gas pressure drops under the atmospheric pressure. In contrast, the atmospheric pressure substantially governs the second chamber, which produces a pressure equalization in the form of a compression shock and forms several large turbulences. The compression shock and the vortex forming in the two chambers lead to a crushing of the fluid particles in the gas (see column 8, lines 10-62).

However, the device according to Wong et al. has the disadvantage of producing undesired crushing and distribution of the particles, for example, particles with very different sizes.

The invention of the instant application has the object to provide a method and a device for producing an aerosol, in which the crushing and distribution of the particles is improved over the prior art.

This object is achieved in that a gas mixed with input particles is so guided that a compression shock occurs downstream of the widened part of the enclosure and outside of the enclosure. This has the advantage that an interference with the compression shock by the walls of the enclosure is avoided. The walls of the enclosure influence the physical parameters in the region of the compression shock, for example the velocity and the pressure, and thus lead to an undesired crushing and distribution of the particles. For example, very different particle sizes appear depending on whether a particle runs through the compression shock in a region near the wall or in a region distant from the wall. A compression shock that is not interfered with by the walls of the enclosure improves the crushing and distribution of the particles.

Another advantage of the invention of the instant application is that input particles can also be fed to the gas outside the enclosure and downstream of the widened part so that it is possible for the gas to contain only a few particles when it is led through the enclosure. Particles within the enclosure interfere with the calculation of the dimensions of the enclosure with the help of underlying flow equations and make

it difficult for the adjustment of the enclosure to a predetermined particle crushing and distribution.

In Wong et al., all compression shocks occur within an enclosure, the purpose of which, among others, is to permit the gas to expand in a controlled manner after the compression shock, through which the forward movement of the gas will be slowed down. Wong et al. do not disclose or suggest guiding the gas whereby the compression shocks occur outside of the enclosure.

Clearly, Wong et al. do not show "guiding the gas with the input particles and causing the gas to flow at the supersonic velocity to cause a compression shock to occur downstream of the end and outside of the enclosure", as recited in claim 1 and "the compression shock occurring downstream of said end and outside of said enclosure", as recited in claim 34 of the instant application.

Claims 1 and 34 are, therefore, believed to be patentable over Wong et al. and since all of the dependent claims are ultimately dependent on claims 1 or 34, they are believed to be patentable as well.

Boiarski et al. allege that a gas mixed with fluid particles, after leaving a chamber through a narrowing opening 70, flows with supersonic velocity and compression shocks occur. It is well know that supersonic velocity can only occur following a narrowest section of a steadily widening segment of an enclosure (so-called "widened nozzle"). For example, it is described in the "Lexikon der Technik" ("Technical Dictionary", Lueger, page 292, volume 1, German Publishing House Stuttgart) that it is possible to produce supersonic speeds in a gas only with the help of a widened nozzle.

It is, therefore, impossible due to physical reasons for supersonic velocity to occur following the narrowing opening 70 as described in Boiarski et al. The opening 70 of the chamber 66 has no widening segment of an enclosure in the direction of flow so that neither a supersonic flow nor compression shocks can occur. Even when the free space outside of the enclosure, which follows the opening 70, is considered to be infinite widening, it cannot lead to a supersonic flow because the gas, as discussed above, must flow in a continuously (that is gradually, not erratically) widening enclosure in order to produce a supersonic velocity. Boiarski et al. do not contain any hint of this kind of continuously widening segment.

Clearly, Boiarski et al. do not show "providing an enclosure having a cross-section continuously widening in a direction of flow and towards an end of the enclosure to achieve a supersonic velocity", as recited in claim 1 and "said gas guiding device having an enclosure with a cross-section continuously widening in a direction of flow and towards an end of said enclosure for achieving the supersonic velocity", as recited in claim 34 of the instant application.

Claims 1 and 34 are, therefore, believed to be patentable over Boiarski et al. and since all of the dependent claims are ultimately dependent on claims 1 or 34, they are believed to be patentable as well.

Wagner describes a precombustion chamber of a diesel engine in which the gas flows in and out the combustion chamber from the cylinder space of the engine. The gas runs through a Laval nozzle like narrowing/widening so that the gas flows in the chamber with supersonic velocity and compression shocks occur. In the regions where the compression shocks occur, particles of fuel are sprayed in, which are crushed in the compression shock. In contrast to the invention of the instant application, the compression shocks occur within an enclosure. Compression shocks outside of an enclosure also make no sense

for a combustion engine because the crushed particles are necessary for the combustion within the precombustion chamber.

Clearly, Wagner does not show "guiding the gas with the input particles and causing the gas to flow at the supersonic velocity to cause a compression shock to occur downstream of the end and outside of the enclosure", as recited in claim 1 and "the compression shock occurring downstream of said end and outside of said enclosure", as recited in claim 34 of the instant application.

Claims 1 and 34 are, therefore, believed to be patentable over Wagner and since all of the dependent claims are ultimately dependent on claims 1 or 34, they are believed to be patentable as well.

In item 12 on pages 6-7 of the above-mentioned Office action, claims 13-16, 18-20, 50-53 and 55-57 have been rejected as being unpatentable over Wong et al. under 35 U.S.C. § 103(a).

As discussed above, claims 1 and 34 are believed to be patentable over the art. Since claims 13-16, 18-20, 50-53 and 55-57 are ultimately dependent on claims 1 or 34, they are believed to be patentable as well.

In item 13 on pages 7-8 of the above-mentioned Office action, claims 24-30 and 33 have been rejected as being unpatentable over Wong et al. and further in view of Sallmann et al. (US Pat. No. 5,096,917) or Gleason et al. (US Pat. No. 4,552,893) under 35 U.S.C. § 103(a).

As discussed above, claim 1 is believed to be patentable over the art. Since claims 24-30 and 33 are ultimately dependent on claim 1, they are believed to be patentable as well.

In item 14 on pages 8-9 of the above-mentioned Office action, claim 12 has been rejected as being unpatentable over Wong et al. and further in view of Sanders ("Principles of Aerosol Technology", pages 18-33) under 35 U.S.C. § 103(a).

As discussed above, claim 1 is believed to be patentable over the art. Since claim 12 is dependent on claim 1, it is believed to be patentable as well.

In view of the foregoing, reconsideration and allowance of claims 1, 3, and 7-61 are solicited.

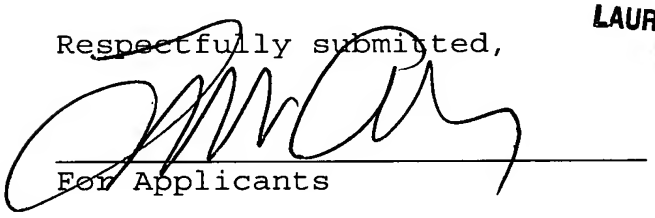
In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate a telephone call so that, if possible, patentable language can be worked out.

In the alternative, the entry of the amendment is requested as it is believed to place the application in better condition for appeal, without requiring extension of the field of search.

If an extension of time for this paper is required, petition for extension is herewith made. Please charge any fees which might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

Respectfully submitted,

LAURENCE A. GREENBERG
REG. NO. 29,308



For Applicants

YC

December 17, 2003

Lerner and Greenberg, P.A.
Post Office Box 2480
Hollywood, FL 33022-2480
Tel: (954) 925-1100
Fax: (954) 925-1101

DRAWING CHANGES

Hon. Commissioner of Patents:

For the purpose of correcting informalities cited by the Chief Draftsman and/or making approved amendments, please allow TEM PATENT to withdraw from the files of the U.S. Patent Office the drawings in the case of :

Applic. No.	: 10/045,835
Applicant	: Klaus List, et al.
Filed	: January 11, 2002
Art Unit	: 1712
Examiner	: Daniel S. Metzmaier
Docket No.	: 2814/1-44
Customer No.	: 24131

December 3, 2003 — Date
Laurence A. Greenberg — Attorney

☑ Correct Informalities cited by Chief Draftsman
☐ Enter amendment approved by Examiner
Other _____

PLEASE PROVIDE COPIES

NAME LERNER AND GREENBERG, P.A.

ADDRESS P.O.BOX 2480, HOLLYWOOD, FL 33022

SPECIAL INSTRUCTIONS:

Dear Tom:

Please file formal drawings with the PTO by December 23, 2003.

Thank You!

Alexia

Mail to
TEM PATENT, INC.
2049 Moneta Road
Bedford, VA 24523

P.O. Box 886
Moneta, VA 24121

Fax: (540) 586-6715